

# WATER QUALITY M E M O R A N D U M

## Utah Coal Regulatory Program

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March 21, 2011

TO: Internal File

THRU: James D. Smith, Permit Supervisor *DS 23 Mar 11*

FROM: Steve Christensen, Environmental Scientist III *SKC*

RE: 2010 3rd Quarter Water Monitoring, Consolidation Coal Company, Hidden Valley Mine, C0150007-WQ10-3, Task ID #3631

The Hidden Valley Mine is in reclamation. At present, the Permittee has no immediate plans for additional coal mining activity at the site. Two surface-water monitoring sites are established to monitor Ivie Creek, a perennial stream adjacent to the mine site. The sites; Upper Ivie #1, and Lower Ivie #2, have been established to quantify any changes in quality or quantity to the Ivie Creek drainage as a result of coal mining related activity. Due to the lack of springs in the area and the lack of underground development/activity, no ground water monitoring is required at this time by the approved Mining and Reclamation Plan (MRP).

Section UMC 817.52 of the approved MRP discusses the water-monitoring plan. The two surface monitoring sites will be sampled and measured during the months of May and September (2<sup>nd</sup> and 3<sup>rd</sup> quarters only). Field parameters will be measured and water samples collected at the same time. Parameters for water analysis are listed in section UMC817.52 of the MRP. There are no springs, ponds or wells on the site. The monitoring program will continue until bond release is obtained.

The Utah Division of Water Quality (DWQ) has assigned use classifications to Ivie Creek and its tributaries from the confluence with Muddy Creek to Utah highway 10. The classifications are:

- 2B: Protected for secondary contact recreation such as boating, wading or similar uses.
- 3C: Protected for non-game fish and other aquatic life, including necessary aquatic organisms in their food chain.
- 4: Protected for agricultural uses including irrigation of crops and stock watering.

Numeric criteria set forth in Utah Administrative Code (UAC) R317-14, have been established for each of the beneficial use classes assigned to waters in the State. Of the use

classifications assigned to the streams in the Western Colorado River Watershed (WCRW), numeric criteria for TDS only apply for agricultural use (beneficial use class 4). Section R317-2 of the UAC identifies a standard TDS value of 2,600 mg/L for Ivie Creek and its tributaries. The primary factors for increased TDS loads in the lower reaches of the Muddy Creek Watershed are from agricultural irrigation practices, surface runoff and natural geological loadings.

**1. Was data submitted for all of required sites?**

**Streams**

YES ☒ NO ☐

Data was reported for both surface water monitoring sites (Upper Ivie #1 and Lower Ivie #2).

**2. Were all required parameters reported for each site?**

**Streams** YES ☒ NO ☐

**3. Were irregularities found in the data?**

**Streams** YES ☒ NO ☐

Values obtained for pH and TDS for this quarter follow historic seasonal trends (See Attached Figures).

A TDS value of 2,600 mg/L is the site-specific standard as established by UAC R317-2, *Standards for Waters of the State*. The TDS values obtained for both Upper Ivie #1 and Lower Ivie #2 for this quarter were 2,606 and 2,836 mg/L respectively.

The Price River, San Rafael River and Muddy Creek TMDLs for Total dissolved Solids West Colorado Watershed Management Unit; Utah document (Utah Division of Water Quality, 2004) discusses how seasonal variations in TDS concentrations have been detected.

Based upon previous sampling data, seasonal TDS trends for the Ivie Creek drainage produce higher values during the 2<sup>nd</sup> quarter (spring/early summer) as opposed to the 3<sup>rd</sup> quarter (late summer/ fall). As a result of snowmelt, irrigation return flow and increased precipitation during the spring/early summer months, it would appear that the ephemeral drainages that contribute flow to Ivie Creek experience a flushing event that produces higher TDS values.

Due to the general lack of appreciable precipitation for the area (averaging <10"/year

annually), the relatively large network of ephemeral drainages in the Ivie Creek watershed remain dry for a majority of the year. As a result, there are significant periods of time where sediments may be deposited in these ephemeral drainages by wind erosion. Following the spring 'flushing event', the data clearly shows that TDS values drop significantly between the 2<sup>nd</sup> and 3<sup>rd</sup> quarter of the year as the sediment has been washed down gradient.

The Ivie Creek drainage has consistently produced TDS levels well above the 2,600-mg/L standard discussed above. However, as the site has been reclaimed and in stable condition, it's unlikely that the elevated TDS levels are a result of coal mining related activity. Recent field inspections by Division staff have documented the site as being in stable condition with no signs of excessive erosion or gullies.

An elevated concentration for dissolved oxygen was obtained from the Lower Ivie #2 water monitoring site. The average dissolved oxygen concentration is 9.11 mg/L. The reported value for the 3<sup>rd</sup> quarter of 2010 was 13.5 mg/L (outside the mean of the dataset by 2.54 standard deviations).

With the exception of dissolved oxygen at Lower Ivie #2, the remaining parameters were within two standard deviations of the mean and followed established seasonal trends.

**4. On what date does the MRP require a five-year resampling of baseline water data.**

The approved MRP does not outline a five-year baseline re-sampling requirement.

**5. Based on your review, what further actions, if any, do you recommend?**

Continue to closely monitor the dissolved oxygen levels within Ivie Creek.

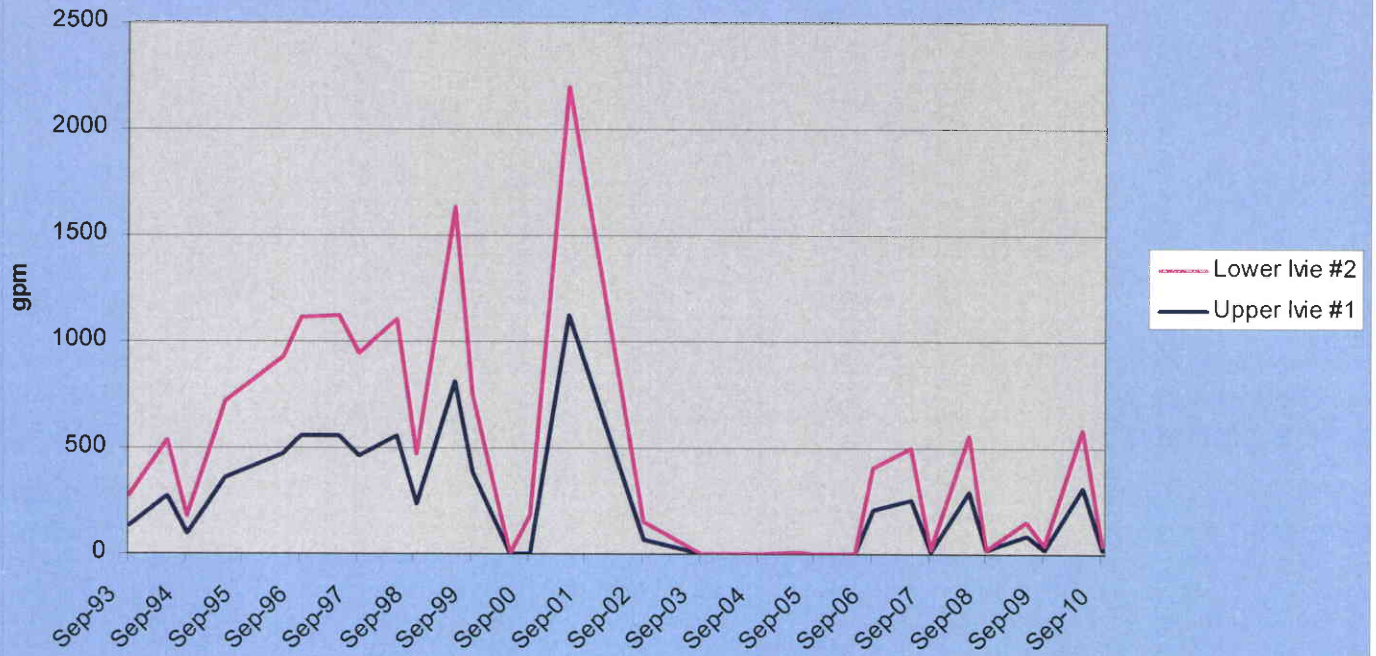
**Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?**

☐ YES    ☒ NO

**6. Follow-up from last quarter, if necessary. Did the Mine Operator submit all the missing and/or irregular data (datum)?**

NA.

### Ivie Creek: Flow vs. Time



### TDS vs. Time

